fish seed collected, necessitates intensification of induced breeding methods in the State.

The present experiments on breeding of major carps were the first undertaken in Gujarat State. Inadequate facilities like lack of ponds and trained personnel were responsible for the limited success. However, the success achieved indicated that there was ample scope for developing Bokh reservoir as a major fish seed production centre in the State.

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17. THE GIANT AFRICAN LAND SNAIL *ACHATINA FULICA* BOWDICH IN BIHAR

The Giant African Land Snail *Achatina fulica*, a native of East Africa, is now widely distributed in all trophical and subtropical countries. In India it has been reported from Bengal (Hornell 1951), Orissa (Behura 1955), Kerala and Andaman-Nicobar Islands.

The snail, is a serious pest of garden crops, vegetables, rubber, tea

and coffee plantations in all countries of its introduction (Jutting 1934; Rees 1950). The first record of its introduction in Bihar was made by Ray (1943), from Santhal Parganas. Since then almost nothing was known of its distribution and behaviour in the State. Our investigations show that *A. fulica* is now well distributed and established in several districts of Bihar namely, Darbhanga, Muzaffarpur, Motihari, Purnea, Saharsa and Santhal Parganas.

Observations made in Purnea show that the snails are very active in the early morning during November to March, and can withstand cold up to 8·8°C. Feeding during this period is restricted to winter vegetables like cabbage, cauliflower, groundnut pods, etc., to which serious damage is inflicted and sometimes two-to-three transplantings of vegetable seedlings have to be made. In the absence of these preferred food, the snail feeds on grasses like *Cyanodon dactylon*. They are most active during the rainy season and feed on kitchen refuse, garbage and all types of vegetables, ornamentals, graminaceous wild plants and some weeds but no damage has so far been observed on paddy crop. *A. fulica* even climbs trees such as banana, *litchi*, citrus, mango, papaya, etc. and damages their foliage. As reported by Behura (1955), the snail is active not only at night but also during mornings and evenings. Considerable numbers are crushed under vehicles while crossing roads in the evening hours.

During hot and sunny weather they hide under dense vegetation. They are active during the day time in cloudy weather only. In case of intermittent sun and clouds, they are sometimes found moving about. They breed during August-September, the former being the most active month. The snails overwinter and aestivate till the end of May and appear again with pre-monsoon rains. Overwintering and aestivation takes place in wet places in the soil at a depth from 72-144 mm. during which the operculum appears to be sealed by protective calcareous matter.

Control by dusting common salt crystals over crawling snails has proved to be effective.

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Patna,
November 9, 1968.

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18. PRELIMINARY OBSERVATIONS ON THE RELATIVE RESISTANCE OF SELECTED SPECIES OF INDIAN TIMBER TO GRIBBLE (*LIMNORIA*) ATTACK

(*With a plate*)

INTRODUCTION

Occurrence of the crustacean wood borer *Limnoria*, commonly known as Gribble, along the Indian coast was first reported by Palekar & Bal (1957), who collected a few specimens from timber panels immersed in Bombay harbour They also noted that crustacean borers are not of any economic importance in the vicinity of Bombay harbour in view of their stray occurrence. The specimens collected by them were assigned to a new species, *Limnoria* (*Limnoria*) *bombayensis* (Pillai 1961). Becker (1959) collected two species, *L. indica* Kampf. & Becker and *L. tripunctata* Menzies from Madras and Mandapam. Five other species have been recorded from the Andaman Islands also (Bernard 1936; Ganapati & Rao 1960). Apart from these records no information is available either on their biology or on the damage caused by them to various species of Indian timber.

Several investigators have pointed out that no timber is resistant to *Limnoria* attack. Even green-heart (*Ocotea rodiaei*), considered highly resistant to marine wood borers, is not immune to the attack of *Limnoria* (Stevenson 1874; Edmondson 1955:29). Moreover no poison is known that is really effective against them and it is found that creosote treatment merely retards and does not prevent *Limnoria* attack. It is reported that *Limnoria* attacks even timber which is impregnated with corrosive sublimate (Mullins & Mullins 1848).

During October-November 1964, a sudden outbreak of damage by *Limnoria* (*Limnoria*) *bombayensis* was noticed on the experimental timber panels immersed in the Bombay harbour and since then they were found to have done considerable damage to the panels of some